Docket No.: 0717-0525PUS1
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Satoshi OKADA

Application No.: Not Yet Assigned

Confirmation No.: N/A

Filed: August 24, 2004

Art Unit: N/A

For: CHARACTER DISPLAY APPARATUS AND CHARACTER DISPLAY METHOD, CONTROL PROGRAM FOR CONTROLLING THE CHARACTER DISPLAY METHOD AND RECORD MEDIUM RECORDING THE CONTROL PROGRAM

Examiner: Not Yet Assigned

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

The PTO is requested to use the amended sheets/claims attached hereto (which correspond to Article 19 amendments or to claims attached to the International Preliminary Examination Report (Article 34)) during prosecution of the above-identified national phase PCT application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §1.16 or 1.14; particularly, extension of time fees.

Dated: August 24, 2004

Respectfully submitted,

By _____
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Attachment(s)

PATENT COOPERATION TREATY

PCT

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:
YAMAMOTO, Shusaku

FIFTEENTH FLOOR, CRYSTAL TOWER, 2-27, SHIROMI 1-CHOME, CHUO-KU, OSAKA-SHI OSAKA 540-6015 JAPAN

NOTIFICATION OF TRANSMITTAL OF INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing *(day/month/year)*	11.5.2004
Applicant's or agent's file reference: 02R00702/PC	**IMPORTANT NOTIFICATION**

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/JP 03/01818	19.02.2003	25.02.2002

Applicant

SHARP KABUSHIKI KAISHA

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/JP	Authorized officer	
Japan Patent Office	**Commissioner of the Patent Office**	2G 9114
3-4-3, Kasumigaseki, Chiyoda-ku, Tokyo 100-8915, Japan	Telephone No. +81-3-3581-1101 Ext. 3226	

ATTENTIONS

1. Demand for copy of documents

Copy of the documents described in the international preliminary examination report and not described in the international search report.

An applicant can request the copy of these cited documents to the Japan Patent Office, however, Japan Patent Information Organization also services sales of the copy of these cited documents. Those who request copying of the cited documents should pay attention to the following points.

[Application Method]

(1) As for Patent (Utility Model, Design) Gazette, the following points shall be defined clearly.

Types of patent, utility model, and design

Fiscal year and number of publication of application or publication of unexamined application (or patent number, registration number)

Necessary number of paper sheets

(2) As for documents except for the gazette, the following points are required attention.

Be sure to attach the copy of the international preliminary examination report (which shall be returned).

[Application and Reference]

〒135-0016

4-1-7 Toyo Koto-ku, Tokyo
Sato Daiya Building
Foundation of Japan Patent Information Organization
Information Processing Department
Copy Service section
TEL: 03-3508-2313

Note) The period for requesting the copy of the documents to Japanese Patent Office is set to 7 years from the international application date.

2. It is necessary to submit the copy of international application (except for cases of already transmitted from the International Bureau) and its prescribed translation, and to pay the national fee. Respective countries set different periods so as to be required attention. (See Treaty Article 22, Article 39, and Article 64 (2) (a) (i))

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
02R00702/PC		
International application No. PCT/JP 03/01818	International filing date *(day/month/year)* 19.02.2003	Priority date *(day/month/year)* 25.02.2002
International Patent Classification (IPC) or national classification and IPC Int.Cl [7] G09G5/28		
Applicant SHARP KABUSHIKI KAISHA		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets, including this cover sheet.

☑ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 9 sheets.

3. This report contains indications relating to the following items:

- I ☑ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☑ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
24.07.2003	20.04.2004
Name and mailing address of the IPEA/JP Japan Patent Office 3-4-3, Kasumigaseki, Chiyoda-ku, Tokyo 100-8915, Japan	Authorized officer 2G 9114 HIROSHI OGAWA Telephone No. +81-3-3581-1101 Ext. 3226

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/JP 03/01818

I Basis of the report

1. With regard to the **elements** of the international application:*

☐ the international application as originally filed

☑ the description:
pages 1-39,41-60 , as originally filed
pages _____ , filed with the demand
pages 40 , filed with the letter of 09.01.2004

☑ the claims:
Nos. 2-5 , as originally filed
Nos. _____ , as amended (together with any statement) under Article 19
Nos. _____ , filed with the demand
Nos. 1, 6-8 , filed with the letter of 09.01.2004

☑ the drawings:
sheets 1/16-16/16 , as originally filed
sheets/figs _____ , filed with the demand
sheets/figs _____ , filed with the letter of _____

☐ the sequence listing part of the description:
pages _____ , as originally filed
pages _____ , filed with the demand
pages _____ , filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:
☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/figs _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* *Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*

** *Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/JP 03/01818

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-8	YES
	Claims		NO
Inventive step (IS)	Claims	1-8	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-8	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

The subject matter of claim 1-8 is neither disclosed in any of the documents cited in the international search report nor obvious to a person skilled in the art.

None of the prior art documents cited in the international search report describes "introducing a predetermined change into the arrangement pattern", "the predetermined change including replacement of a position of the basic portion or duplication of the basic portion", and "determining a luminance level of the first pixel based on the changed arrangement pattern".

to "0" as a background, is set to be "255".

In this embodiment, a luminance level is determined as follows. As shown in Figure 2C, a sub-pixel(s) corresponding to a basic portion (i.e., a sub-pixel(s) to which a basic portion is assigned) is extracted from M+2×N sub-pixels (M sub-pixels 16 contained in a pixel (pixel of interest) 15 whose luminance level is to be determined and N sub-pixels 17 neighboring on each side of pixel 15). Based on the arrangement pattern of the extracted sub-pixel(s), the luminance levels (i.e., pixel value) of M sub-pixels 16 contained in the pixel 15 of interest are determined.

Figure 3 is a diagram showing an example of the pixel value table 5e. In Figure 3 and Figures 4 to 7, it is assumed that the number (M) of the sub-pixels 16 contained in the pixel 15 of interest shown in Figure 2C is 3 (M=3), and the number (N) of the sub-pixels 17 on each side of the pixel 15 is 3 (N=3). Note that the number N of the above-described sub-pixels is typically the same as the number of elements in a correction pattern (N=3 in Figure 10). The left-hand side of Figure 3 shows an arrangement pattern of 9 sub-pixels contained in 3 pixels (the pixel 15 of interest and pixels on the both sides thereof) which are arranged in the same

CLAIMS

1. (Amended) A character display apparatus, comprising:

a display device comprising a plurality of pixels; and

a control section for controlling the display device,

wherein each of the plurality of pixels comprises a plurality of sub-pixels arranged in a predetermined direction, and at least one of a plurality of color elements is assigned to each of the plurality of sub-pixel;

the control section determines at least one sub-pixel, to which a basic portion indicating a skeleton of a character is assigned, among the plurality of sub-pixels in the display device, based on character shape data indicating character shapes;

a first pixel of the plurality of pixels comprises a plurality of first sub-pixels;

at least one pixel neighboring the first pixel comprises a plurality of second sub-pixels;

the control section determines an arrangement pattern containing a plurality of elements, wherein a value of each of the plurality of elements is determined depending on whether or not the basic portion is assigned to a corresponding sub-pixel of the plurality of the first

sub-pixels and the plurality of the second sub-pixels; and

the control section introduces a predetermined change into the arrangement pattern, the predetermined change including replacement of a position of the basic portion or duplication of the basic portion, and determines a luminance level of the first pixel based on the changed arrangement pattern.

2. An apparatus according to claim 1, wherein the plurality of elements include a first element and a second element neighboring the first element;

a value of the first element indicates that the basic portion is assigned to a sub-pixel relating to the first element;

a value of the second element indicates that the basic portion is not assigned to a sub-pixel relating to the second element; and

the control section determines the luminance level of the first pixel based on another arrangement pattern which is modified from said arrangement pattern such that a value of the first element is interchanged with a value of the second element.

3. An apparatus according to claim 1, wherein the plurality

of elements include a first element and a second element neighboring the first element;

a value of the first element indicates that the basic portion is assigned to a sub-pixel relating to the first

6. (Amended) A method for displaying a character on a character display apparatus, wherein

the character display apparatus comprises:

a display device comprising a plurality of pixels; and

a control section for controlling the display device,

wherein each of the plurality of pixels comprises a plurality of sub-pixels arranged in a predetermined direction, and at least one of a plurality of color elements is assigned to each of the plurality of sub-pixel;

a first pixel of the plurality of pixels comprises a plurality of first sub-pixels; and

at least one pixel neighboring the first pixel comprises a plurality of second sub-pixels,

the method comprises the steps of:

determining at least one sub-pixel, to which a basic portion indicating a skeleton of a character is assigned, among the plurality of sub-pixels in the display device, based on character shape data indicating character shapes;

determining an arrangement pattern containing a plurality of elements, wherein a value of each of the plurality of elements is determined depending on whether or not the basic portion is assigned to a corresponding sub-pixel of the plurality of the first sub-pixels and the plurality of the second sub-pixels; and

introducing a predetermined change into the arrangement pattern, the predetermined change including replacement of a position of the basic portion or duplication of the basic portion, and determining a luminance level of the first pixel based on the changed arrangement pattern.

7. (Amended) A program for causing a character display apparatus to execute a character display process, wherein

the character display apparatus comprises:

a display device comprising a plurality of pixels; and

a control section for controlling the display device,

wherein each of the plurality of pixels comprises a plurality of sub-pixels arranged in a predetermined direction, and at least one of a plurality of color elements is assigned to each of the plurality of sub-pixel;

a first pixel of the plurality of pixels comprises a plurality of first sub-pixels; and

at least one pixel neighboring the first pixel comprises a plurality of second sub-pixels, and

the character display process comprises the steps of:

determining at least one sub-pixel, to which a basic portion indicating a skeleton of a character is assigned, among the plurality of sub-pixels in the display device, based on character shape data indicating character shapes;

determining an arrangement pattern containing a plurality of elements, wherein a value of each of the plurality of elements is determined depending on whether or not the basic portion is assigned to a corresponding sub-pixel of the plurality of the first sub-pixels and the plurality of the second sub-pixels; and

introducing a predetermined change into the arrangement pattern, the predetermined change including replacement of a position of the basic portion or duplication of the basic portion, and determining a luminance level of the first pixel based on the changed arrangement pattern.

8. (Amended) A recording medium storing a program for causing a character display apparatus to execute a character display process, wherein the recording medium is readable by the character display apparatus,

the character display apparatus comprises:

a display device comprising a plurality of pixels; and

a control section for controlling the display device,

wherein each of the plurality of pixels comprises a plurality of sub-pixels arranged in a predetermined direction, and at least one of a plurality of color elements is assigned to each of the plurality of sub-pixel;

a first pixel of the plurality of pixels comprises a plurality of first sub-pixels; and

at least one pixel neighboring the first pixel comprises a plurality of second sub-pixels, and

the character display process comprises the steps of:

determining at least one sub-pixel, to which a basic portion indicating a skeleton of a character is assigned, among the plurality of sub-pixels in the display device, based on character shape data indicating character shapes;

determining an arrangement pattern containing a plurality of elements, wherein a value of each of the plurality of elements is determined depending on whether or not the basic portion is assigned to a corresponding sub-pixel of the plurality of the first sub-pixels and the plurality of the second sub-pixels; and

introducing a predetermined change into the arrangement pattern, the predetermined change including

replacement of a position of the basic portion or duplication of the basic portion, and determining a luminance level of the first pixel based on the changed arrangement pattern.